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ABSTRACT

In 1977, a longitudinal study was undertaken to determine the effects of health curricula on children's knowledge level; their attitudes toward good health practices; and their smoking, drinking, and drug-use behavior. Knowledge and attitude tests and a student survey were administered to students who entered kindergarten in 1977. These children were followed longitudinally and retested from first through third grade. Starting in 5th grade, another group of children was added and all children were followed through 12th grade. One group of children received the "Growing Healthy" curriculum from kindergarten through sixth grade. A second group received the standard textbook approach through third grade, then Growing Healthy for fourth through sixth grades. A third group received the standard textbook approach from kindergarten through sixth grade. The findings provide much positive evidence that the elementary school curriculum that children receive has an impact upon their levels of knowledge about health and their attitudes toward health; in addition these curricula appear to have an impact upon present and future health practices of students. Early intervention (using the Growing Healthy curriculum) with children as they entered the school system, when compared with intervention only during the early onset years or compared with standard elementary school health curricula, had a positive impact on the level of children's health knowledge, attitudes, and reported behavior in the reported use of tobacco, alcohol, and other drugs. (NB)

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The Effects of School Health Curricula on Knowledge, Attitudes, and the Onset of Substance Abuse from Kindergarten to Grade 12

College of Education

UNIVERSITY OF WYOMING
Laramie, Wyoming

The New Generation of American Schools

CG024609

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The Effects of School Health Curricula on Knowledge, Attitudes, and the Onset of Substance Abuse from Kindergarten to Grade 12

By
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Report Series 1992 - No. 1

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THE EFFECTS OF SCHOOL HEALTH CURRICULA ON KNOWLEDGE, ATTITUDES, AND THE ONSET OF SUBSTANCE ABUSE FROM KINDERGARTEN TO GRADE 12

INTRODUCTION

Changing Views of the "Rites of Passage"

Children's attitudes about what is appropriate adult behavior begin at an early age. Many believe that the "rites of passage" into adulthood include learning to smoke, drink alcohol, and engage in sexual activity. These notions about behavior are influenced by parents' behavior, peer group values, and product advertising material. In spite of the fact that numerous studies on adolescent children have found that these children realize the hazards to health that result from engaging in such practices as smoking, young people today engage in these undesirable health practices at younger and younger ages.[1]

A major goal of health education projects throughout the world has been to stem the alarming increase in the abuse of drugs, alcohol, and other substances by increasingly younger populations. Earlier studies, which emphasized only knowledge about health, found little impact on student smoking behavior.[2] More recent reviews indicate that health curricula can be successful in creating positive health attitudes and behavior in school-age populations.[3] It is important in reviewing this literature to be aware of the major differences between earlier health projects and those that seem successful today.

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[1]Office on Smoking and Health, 1980 Directory of On-Going Research in Smoking and Health (Washington, D.C.: U.S. Department of Health and Human Services, Public Health Service World Health Organization, 1980.

[2]E.L. Thompson. "Smoking Education Programs 1960-1976," American Journal of Public Health 68 (1978): 250-257.

[3]Eric Schaps et al., Primary Prevention Evaluation Research. Walnut Creek CA: PYRAMID Project Pacific Institute for Research and Evaluation, March 1978. P. Caramanica, E.G. Fieler, and L.K. Olson, "Evaluation of the Effects of Performance-Based Teacher Education on the Health Knowledge and Attitudes of Fifth Grade Students," The Journal of School Health XLIV, no. 8 (October 1974): 449-54. Larry K. Olson et al., "The School Health Curriculum Studies: A Review Research Studies," Health Education, January/February 1980, pp. 16-20.

Recent studies document that information-based health education efforts are not adequate to produce behavior change. Botvin and Eng[4] found that many smoking-prevention programs that dealt only with factual information concerning the deleterious effects of cigarette smoking resulted in changing student attitudes and increasing their level of knowledge about cigarette smoking, but had little impact on student behavior.

Recent programs that affect social factors involved in substance use and abuse have produced significantly better behavioral results. The School Health Curriculum Project (SHCP) utilizes strong affective strategies in its program design. Olson, Redican, and Krus[5] reported positive influences on the health knowledge, attitudes, and student behavior involved in this program. Students involved in the SHCP evidenced significant cigarette smoking attitude and behavior changes in a healthful direction during their exposure to the curriculum.

Changing from knowledge to attitudes and values in health curricula

Recent research reported by Andrews and Hearne[6] and from various countries around the world[7] substantiates the belief that primary prevention programs that begin as early as kindergarten have an impact on children's health knowledge, attitudes toward health, and positive health behavior. Collectively, the research to date offers evidence that school health programs that include both cognitive and affective strategies, rather than cognitive strategies alone, are most successful in producing positive behavior results in

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[4]Anna Eng and Gilbert Botvin, "A Comprehensive School-Based Smoking Prevention Program," The Journal of School Health 50, no. 4 (1980): 209-213.

[5]L.K. Olson, K.J. Redican, and P. Krus. "The School Health Curriculum Studies" Health Education, January/February 1980, pp. 16-20.

[6]R.L. Andrews and J.T. Hearne, "The Effects of an Experimental Primary Grades Health Curriculum on Health Knowledge, Attitudes, and Behavior of Fifth Grade Students," a paper presented at the Annual Meeting of the American School Health Association, October 1984.

[7]Abstracts, Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983.

upper elementary and adolescent children and in some cases among their parents as well.[8]

In 1977 the American Lung Association funded a longitudinal study to determine the effects of health curricula on: (a) the knowledge level of children; (b) children's attitudes toward good health practices; and (c) the smoking, drinking, and drug-use behavior of children.

To examine these questions, knowledge and attitude tests and a student survey were developed and administered to students who entered kindergarten in 1977 in five Northeast suburban school districts. These same children were followed longitudinally and retested from first through third grade. Starting in fifth grade a third group of children were added. These three groups of children were then followed through twelfth grade. Students participated in the study as intact classroom groups, with all students in the same school district receiving the same curricular materials. Data obtained were analyzed using standard statistical procedures. Following are results of these analyses.

Knowledge Test

Each year students were given a cognitive test that varied in length. At kindergarten the test consisted of 31 items. However, beginning with sixth grade, the end of the treatment period, the test consisted of 53 items and these same items were used through twelfth grade. A summary of these results is presented in Table 1 and Figure 1. For kindergarten through third grade there were only two groups of children. One group of students received Growing Healthy from kindergarten through sixth grade. A second group received the standard textbook approach through third grade, then Growing Healthy for fourth through sixth grades. The third group received the standard textbook approach from kindergarten through sixth grade. Starting at fifth grade and continuing through twelfth grade, a third group was added to the initial two groups. Analyses of knowledge test scores supported the conclusion that children who had received the Growing Healthy curriculum would have higher levels of knowledge than would those who had not received the curriculum.

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[8]R.L. Andrews and J.T. Hearne, "The Effects of an Experimental Primary Grades Health Curriculum on Health Knowledge, Attitudes, and Behavior of Primary Grade Students." Paper presented at the American Educational Research Association, Montreal, Canada, 1983.

Table 1
Knowledge about Good Health and the Effects of Smoking

	Grade Level										
Group	K	1	2	3	5	6	7	9	10	11	12
Growing Healthy*	19.8	45.5	24.1	28.3	32.3	32.6	35.9	34.9	37.0	38.8	38.8
Text/Growing Healthy	20.2	41.4	14.6	25.6	31.1	31.0	32.8	33.3	35.7	37.9	38.9
Text Only	---	---	---	---	26.0	26.3	34.4	31.3	34.7	35.8	35.9

At each grade level with the exception of kindergarten, students who had received the Growing Healthy curriculum had significantly higher levels of knowledge about health and how to maintain themselves as healthy people than did children who had not received the program. Data pertaining to level of attitudes and personal experimentation, experimentation by friends, smoking and drinking behavior, and future expectancy to smoke, drink alcohol, and use drugs are presented in a series of tables and figures on the pages that follow.

Health Attitudes

Each year of the study, students were given a 31-item test designed to measure their attitudes toward maintaining themselves as healthy people and not smoking. The average score for each group of students is presented in Table 2. For kindergarten through third grade there were only two groups of children. The children in one group received the Growing Healthy curriculum from kindergarten through sixth grade; the children in the other group were taught health education using a standard health-textbook approach from kindergarten through fourth grade and Growing Healthy in fifth and sixth grades. Starting at fifth grade and continuing through twelfth grade, there was a third group added to the initial two groups who received the standard textbook approach to health education from kindergarten through sixth grade.

As can be seen in Table 2 and Figure 2, the attitudes of students were only slightly in the positive direction or negative direction when these students entered school (77.2 and 76.8, respectively). As they progressed through the early grades of schooling, their attitudes

Figure 1
Knowledge Scores of Students Growing Healthy,
Text/Growing Healthy, and Text Only

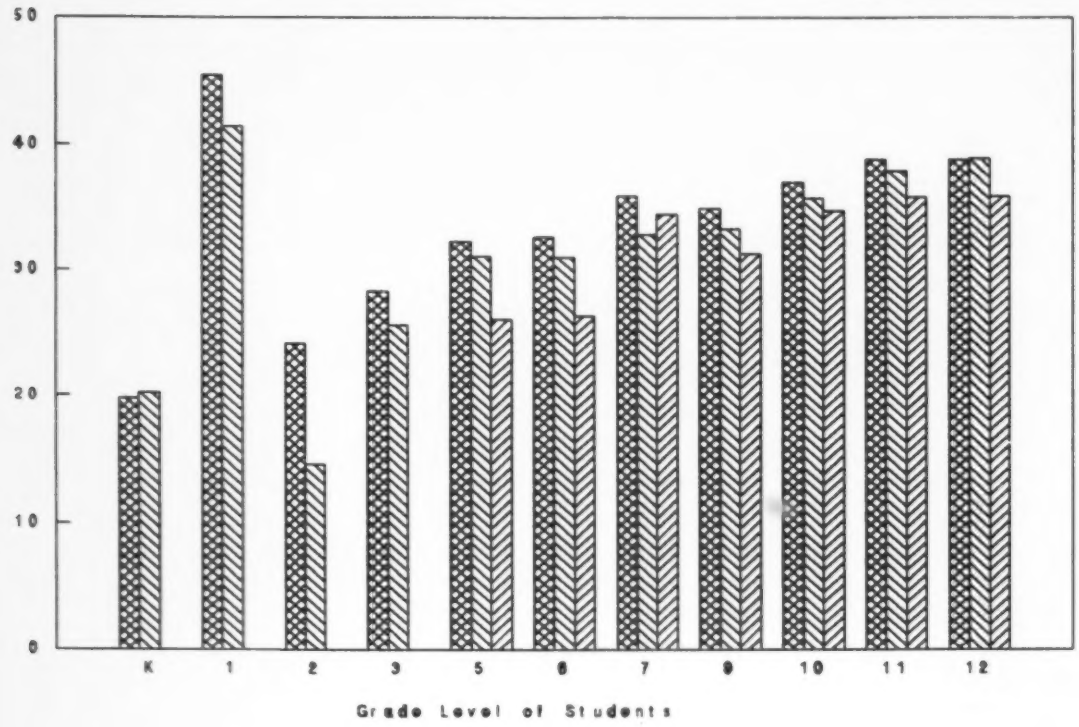
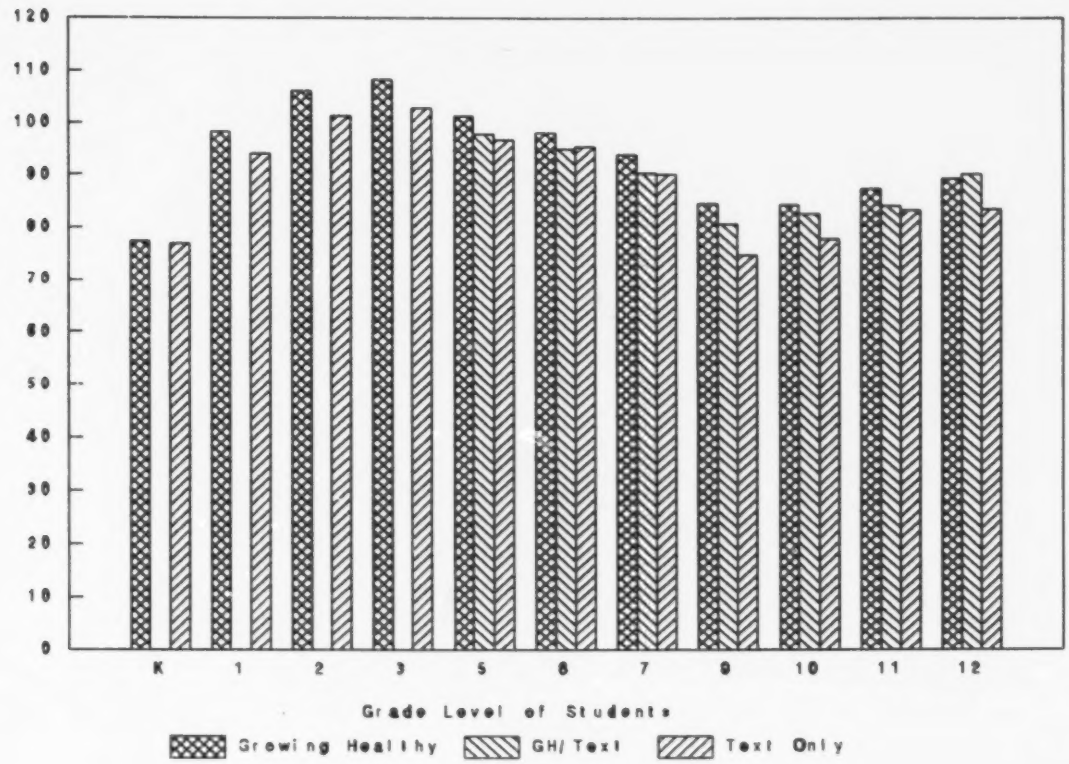


Table 2
Attitudes Toward Maintaining Good Health and Not Smoking

	Grade Level										
Group	K	1	2	3	5	6	7	9	10	11	12
Growing Healthy*	77.2*	98.2	106.0	108.1	101.2	98.0	93.8	84.5	84.2	87.2	89.3
Text/Growing Healthy	---	---	---	---	97.7	94.9	90.4	80.6	82.5	84.0	90.0
Text Only	76.8	94.1	101.3	102.8	96.7	95.4	90.0	74.7	77.7	83.1	83.3

*The higher the score, the more positive the attitude. A neutral score would be 77.8.

Figure 2
Affective Scores of Students Growing Healthy,
Text/Growing Healthy, and Text Only



toward health became progressively more positive, with the Growing Healthy students' attitudes becoming significantly more positive than the attitudes of the students in the other group. However, as can be seen in Figure 2, student attitudes began to decline between the end of the third grade and the end of the fifth grade. The rate of decline was about the same for all groups of students. At each grade except sixth grade, the Growing Healthy students maintained significantly more positive attitudes toward good health and negative attitudes toward smoking. The differences between the Growing Healthy and students who received a combination of Growing Healthy and standard textbook education grew less over time. Both

Growing Health has a significant affect on what students know

groups of students, however, displayed more positive attitudes than did those who received only the standard textbook approach. For example, at ninth grade, Growing Healthy students' attitude score was 84.5, the score of students who had the program only during fourth, fifth, and sixth grades was 80.6, and the score of their counterparts who had not had the program was 74.7. As the students moved from ninth grade to tenth, eleventh, and twelfth grades, both groups of students who experienced all or part of the Growing Healthy curriculum maintained more positive attitudes than did those students who received the standard textbook only approach. However, the magnitude of the difference among the groups declined after ninth grade.

Experimentation with Smoking

Data for percentage of students' responses to questions regarding experience, exposure, and future expectancy to smoke are presented in Table 3. These data are presented graphically in Figures 2, 3, and 4. As can be seen from the data in Table 3, several differences were found among the groups of students. These differences were related to both age of students and type of experimentation. For example, in the younger ages (third and fifth grades), differences tended to be exhibited across all categories (i.e., tried smoking, friends tried smoking, smoke on a regular basis, and will smoke when an adult). In each case, children who had received the Growing Healthy curriculum reported less experimentation, exposure to experimentation, and future expectancy to smoke. By the time these children had reached ninth grade, however, differences in experimentation and exposure to experimentation were no longer evident. While the Growing Healthy students were somewhat less inclined to experiment by the end of ninth grade--56 percent of the Growing Healthy students reported having experimented with smoking compared to 68 percent of the Text Only students, these differences were not large enough to be statistically significant. However, for reported smoking on a regular basis there were significant differences. Twenty-four percent of the Growing Healthy students reported smoking on a regular basis, compared to 34 percent of the Text Only students. These differences were also found at the end of eleventh grade. However, by the end of twelfth grade no such differences were found.

Students' attitudes about health can be changed through school curricula

As can be seen in Figures 2 and 3, the bars in the graphs shift decidedly upward for all three groups of students as they progressed through the various grade levels, indicating increasing levels of

Table 3
Percentage of Student Responses to Questions
Regarding Experience, Exposure, and Future Expectancy to Smoke

	Grade Level of Students							
	3	5	6	7	9	10	11	12
Percentage of Students Who Have Tried Smoking								
Growing Healthy	7	26*	36*	52	56	70	73	68
Text/Growing Healthy	8	19	31	47	64	70	72	67
Text Only	-	32	45	47	68	73	74	68
Percentage of Students Who Reported that Friends had Tried Smoking								
Growing Healthy	14*	16*	36	80	85	85	86	87
Text/Growing Healthy	19	17	37	75	83	84	86	88
Text Only	-	35	38	69	84	87	88	88
Percentage of Students Who Reported Smoking on a Regular Basis								
Growing Healthy	1*	1*	0	11	24*	29	31	27
Text/Growing Healthy	4	1	2	9	25	25	36	31
Text Only	-	3	2	9	34	32	37*	29
Percentage of Students Who Think They Will Smoke as Adults								
Growing Healthy	2*	4*	4	9*	12	14	14	11
Text/Growing Healthy	5	2	4	9	10	10	13	11
Text Only	-	6	4	11	13	34	20	17*

*Denotes differences significant at the .05 level or greater.

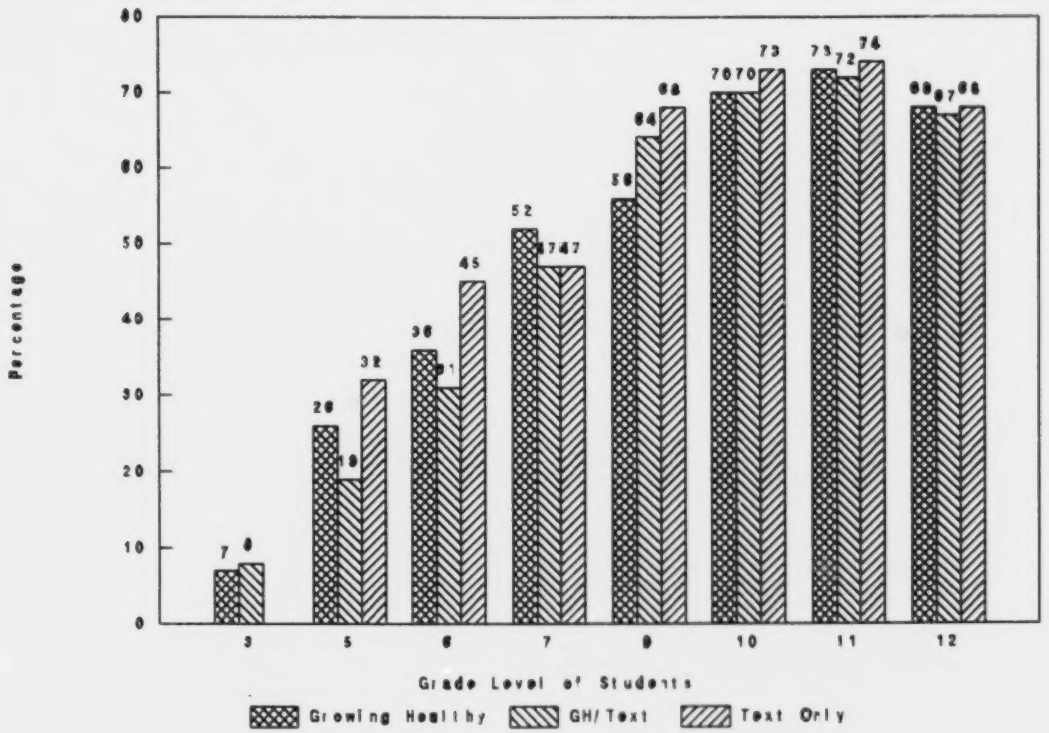
experimentation with smoking. The bars, however, tend to converge at seventh grade, with little difference observed between the three groups of students. The distance between the three groups increased between seventh and ninth grades, with the greatest differences found between the students who had received the Growing Healthy curriculum from kindergarten through sixth grade and those students who had received only the standard textbook approach to health education.

As can be seen in Figure 3, less than 10 percent of the students had experimented with smoking at the end of the third grade. The percentage of students who reported having tried smoking steadily increased at each grade level, culminating in over 65 percent of all students reporting having experimented with smoking by the beginning of the twelfth grade. At each grade level except seventh and twelfth grades, students who had received the Growing Healthy curriculum reported less experimentation with smoking than did those who had not experienced the curriculum. However, at seventh grade the graphs all converge to about the same level of reported experimentation--52, 47, and 47 percent, respectively. These percentages are not significantly different from each other. At the beginning of the ninth grade, a marked difference again appears in the reported experimentation. Growing Healthy students reported significantly lower levels of experimentation (56% and 64%, respectively) than did their counterparts who had not received the curriculum (68%). However, from that point on there are no differences in level of experimentation.

Data for smoking on a regular basis are presented in Figure 4. These graphs are markedly different from those for the casual experimentation with smoking. The graphs for all groups of students remained at about 2 percent from third through sixth grade. However, these percentages increased fourfold by the end of the seventh grade, and more than doubled again from seventh grade to the beginning of the ninth grade. Less than 2 percent of the population of students reported smoking on a regular basis at the end of the sixth grade; over 25 percent of the total sample of students reported smoking on a regular basis at the beginning of the ninth grade. The significance of the differences between the Growing Healthy students and those who had the standard textbook approach to health education are evident from the distance between the bars at ninth and eleventh grades. While the Growing Healthy students reported lower levels of onset of smoking, the dramatic rise in the incidence of smoking is alarming for all groups of students.

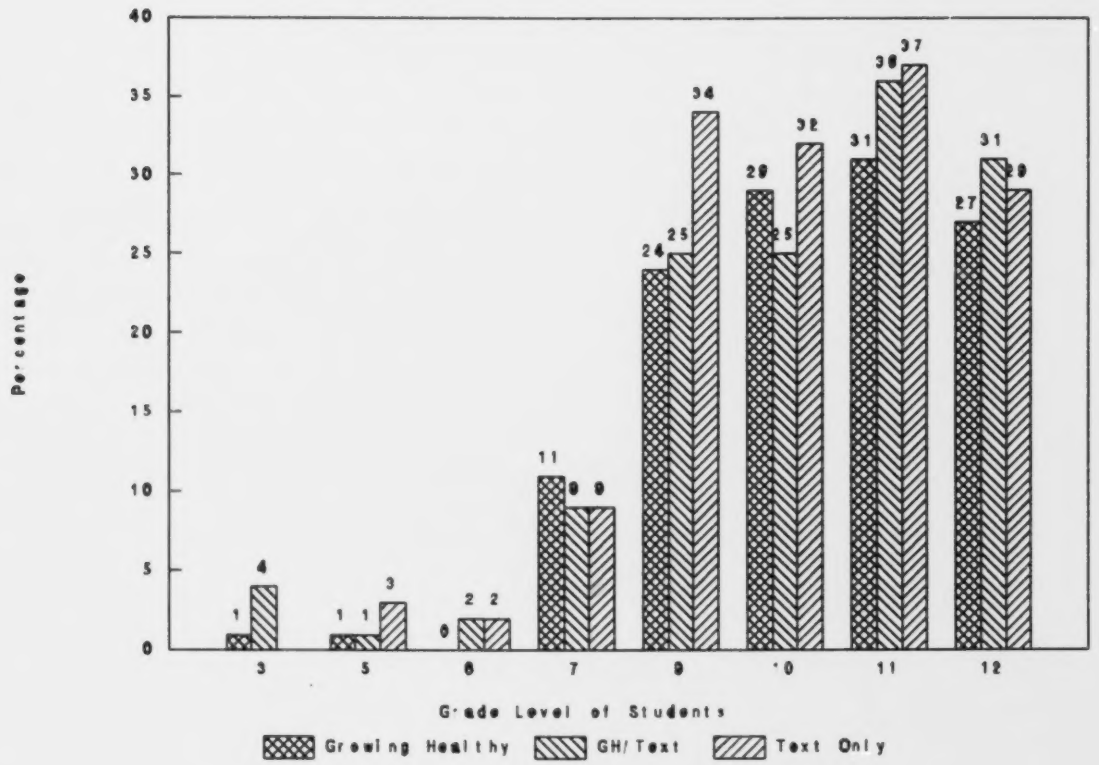
Students show an alarming increase in negative health values when they enter junior high

Figure 3
Percentage of Students Who Have Tried Smoking by Grade and Groups
(Growing Healthy, Text/Growing Healthy, and Text Only)



The data graphed in Figure 5 are an interesting contrast to the data presented in Figure 4. They are similar in that the percentage of students in the sample exhibited, through sixth grade, low levels of belief that they would smoke as adults (4%). These levels increase to nearly 10 percent by the end of the seventh grade, and to only about 12 percent by the beginning of the ninth grade. However, there was a sharp increase at tenth grade, but level off to about 15 percent of the sample. As noted in Figure 4, nearly 30 percent of the students reported smoking on a regular basis; however, only

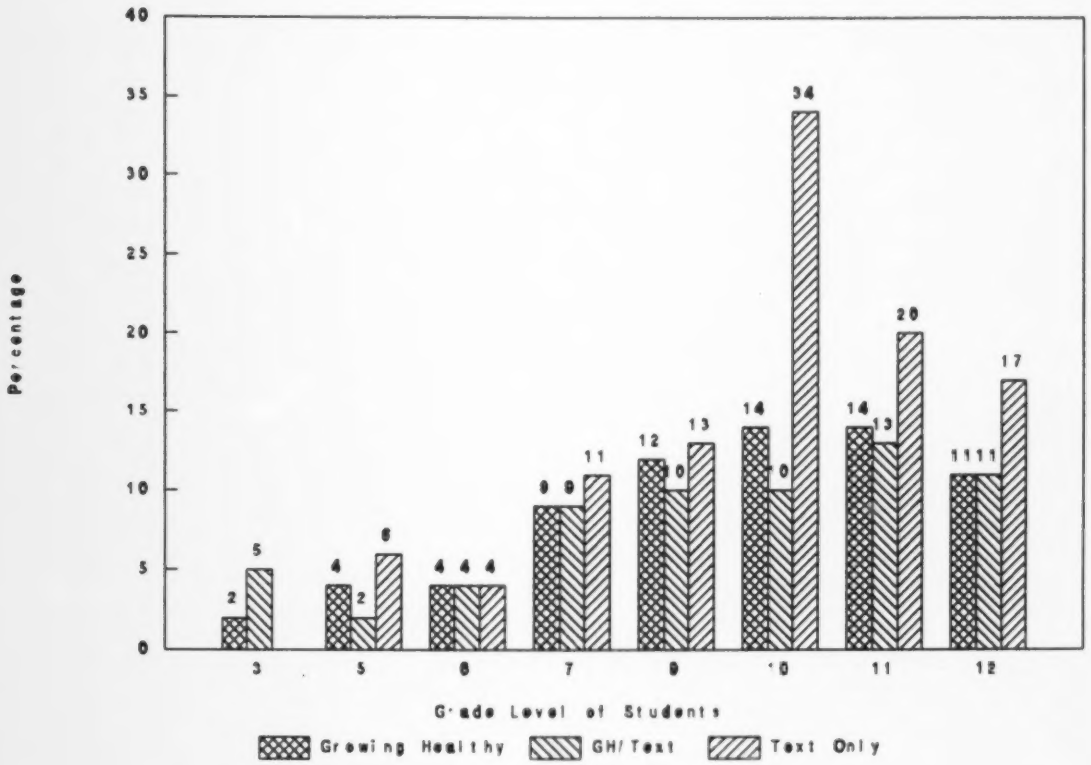
Figure 4
Percentage of Students Reporting Smoking on a Regular Basis
by Grades and Groups (Growing Healthy,
Text/Growing Healthy, and Text Only)



about a third as many students believe they would smoke as adults (12%).

These data suggest that Growing Healthy has a positive effect upon the smoking behavior of children, particularly before onset of smoking (3rd grade) and after onset (9th grade).

Figure 5
Percentage of Students Who Think They Will Smoke as Adults
by Grade and Groups (Growing Healthy,
Text/Growing Healthy, and Text Only)



Drinking Alcohol

Presented in Table 4 and Figures 6, 7, and 8 are the percentages of the three groups of students who reported that they had experimented with, used, or expected to use alcohol in the future. When compared to experience with smoking, the incidence of experimentation with alcohol is much greater for all age groups. As can be seen in Table 4, students' experimentation with alcohol, when compared to smoking, Table 3, (93% v. 50% at 9th grade; 92% v. 68% at 12th grade), and drinking behavior compared to smoking behavior (34% v. 25% at 9th grade; 71% v. 29% at 12th grade) are

Table 4
Percentage of Student Responses to Questions
Regarding Experience, Exposure, and Future Expectancy to Drink

	Grade Level of Students							
	3	5	6	7	9	10	11	12
Percentage of Students Who Have Tried Alcohol								
Growing Healthy	56	80	88	92	93	92	94	90
Text/Growing Healthy	65	75	84	86	90	90	89	93
Text Only	-	73	76	89	96	92	96	92
Percentage of Students Who Reported that Friends had Tried Drinking								
Growing Healthy	31*	30	63	80	80	95	94	91
Text/Growing Healthy	44	37	60	73	83	89	89	95
Text Only	-	27	58	78	84	92	93	91
Percentage of Students Who Reported Drinking on a Regular Basis								
Growing Healthy	10*	4*	4*	34	31*	38	65	70
Text/Growing Healthy	23[a]	4	6	23	35	39	60	71
Text Only	-	12	15	36	40	49	66	72
Percentage of Students Who Think They Will Drink as Adults								
Growing Healthy	11	30*	48	37	44*	66	71	69
Text/Growing Healthy	19	37	37	39	58	61	60	60
Text Only	-	27	45	40	64	66	66	65

*Denotes differences significant at the .05 level or greater.
[a]Does not account for religious differences.

higher for these categories. For example, at the third grade, only about 8 percent of the students had tried smoking, while nearly 60 percent had tried drinking alcohol. At ninth grade, about 60 percent had tried smoking, while over 90 percent had tried drinking alcohol. As can be seen in Table 4, few differences were found between the three groups of students in their experience with alcohol. Differences that were found, however, were in important areas--e.g., drinking on a regular basis.

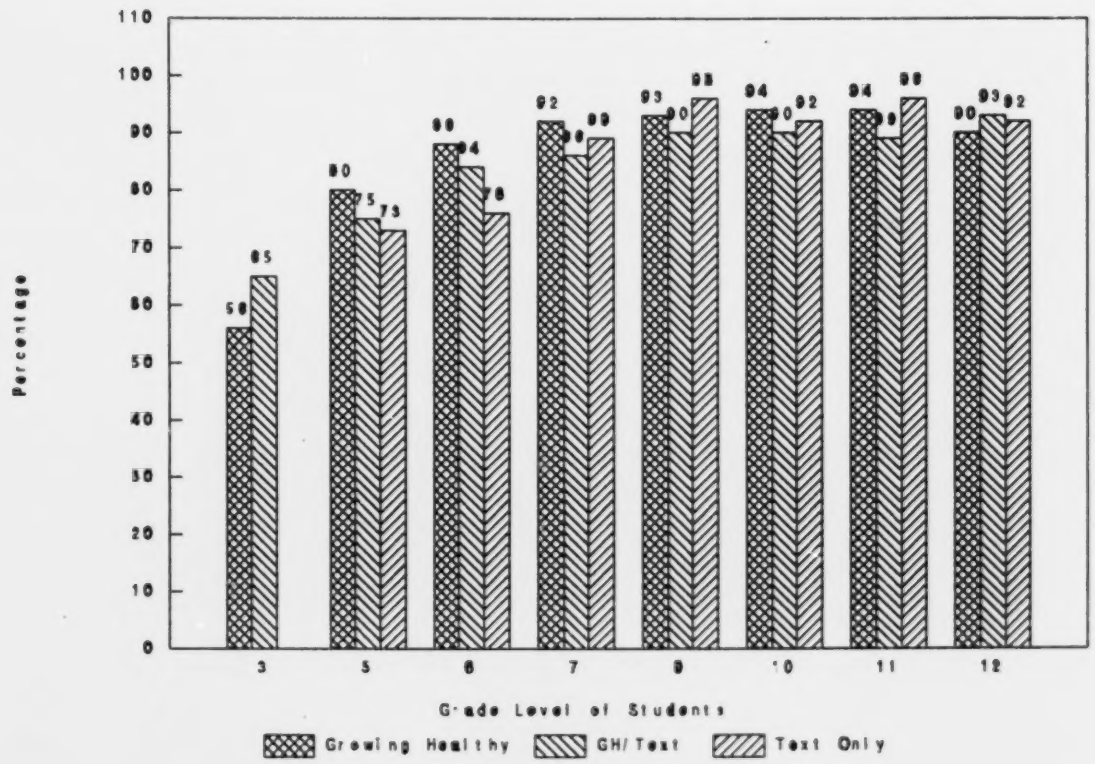
Students seem to experiment with alcohol no matter what we do

Differences in drinking on a regular basis were found for all age groups except when the students were in the seventh grade until grade nine, then there were no differences through twelfth grade. As is evidenced in the data in both Table 4 and Figure 6, there was a disturbing increase in the percentage of students who reported drinking on a regular basis from sixth to the seventh grades. While only 4, 6, and 15 percent of the three groups of students, respectively, reported smoking on a regular basis at the beginning of the ninth grade, 31, 35 and 40 percent of the three groups of students reported drinking on a regular basis. These data are also supported by a corresponding increase in future expectancy to drink. An encouraging note, however, is that although the increases are great for all groups, the increases were significantly less for Growing Healthy students. For both smoking on a regular basis and future expectancy to smoke, the percentage of students was significantly lower for the students who had either received the Growing Healthy curriculum from kindergarten through sixth grade or from fourth through sixth grades, when compared to those students who had not had the curriculum at any level.

The percentage for each group of students who reported that they had experimented with drinking is graphically presented in Figure 6.

As can be seen in Figure 6 when compared to the graphs in Figure 3, experimentation with drinking, when compared to smoking, starts at a much earlier age. Nearly 60 percent of the sample of students reported that they had experimented with alcohol by the end of the third grade, compared to only about 10 percent for smoking. Much like experimentation with smoking, the number of students who reported that they had experimented with drinking showed a steady increase at each grade level. At ninth grade, over 90 percent of the students reported that they had experimented with drinking. Presented in Figure 7 is a comparison of the three groups of students on reported drinking on a regular basis.

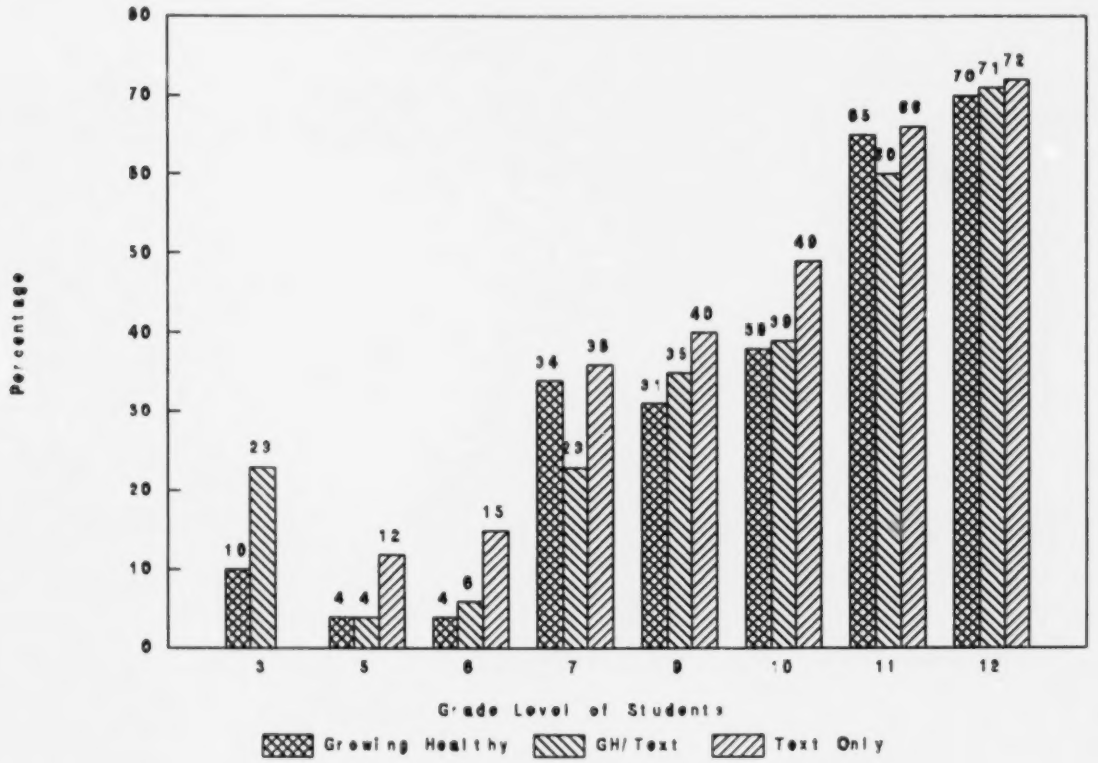
Figure 6
Percentage of Students Who Have Tried Drinking
by Grade and Groups (Growing Healthy, Text/Growing Healthy, and Text Only)



As noted earlier, no comparable data were available for drinking on a regular basis at third grade. The question asked of third-grade students did not distinguish between drinking on a regular basis and drinking for religious purposes. This distinction was begun at fifth grade. As can be seen in Figure 7, the graphs for drinking on a regular basis illustrate a pattern similar to that for smoking. The incidence of drinking stayed relatively low (less than 10%) through sixth grade, then turned dramatically upward for the sample of students through the beginning of the ninth grade (over 35%). An interesting difference, however, is that there was a steady increase in reporting smoking on a regular basis for all groups across the

We can retard the inset of habitual drinking

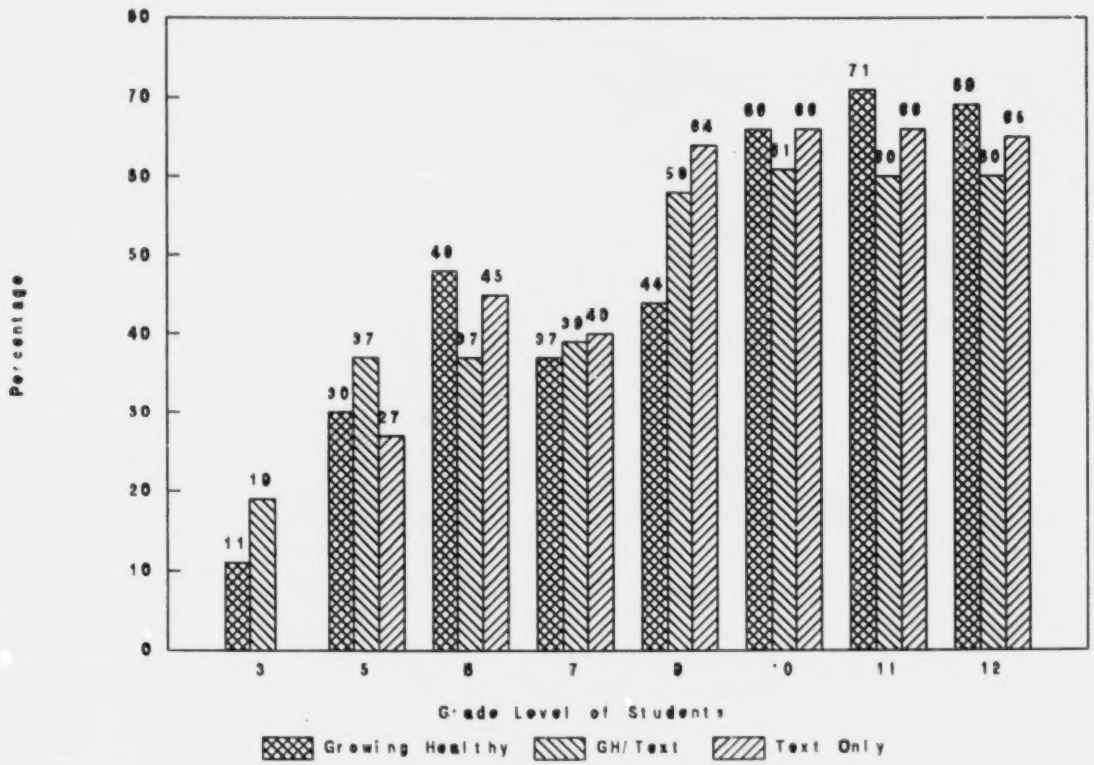
Figure 7
Percentage of Students Reporting Drinking on a Regular Basis
by Grades and Groups (Growing Healthy, Text/Growing Healthy, and Text Only)



various grade levels. This was true in the case of drinking on a regular basis only for those students who had not received any of the curriculum or had received the curriculum for fourth through sixth grades. Children who had received the Growing Healthy curriculum from kindergarten through sixth grade reported a reduction in drinking on a regular basis (34 to 31%) from seventh to ninth grades. However, the pattern of onset of drinking on a regular basis increased nearly twofold over the next two years.

Data on future expectancy to drink are presented in Figure 8. As can be seen in Figure 8, the groups of students' expectations to

Figure 8
Percentage of Students Who Think They Will Drink as Adults
by Grade and Groups (Growing Healthy, Text/Growing Healthy, and Text Only)



drink as adults resulted in a confusing pattern beginning at the fifth grade. The percentage of students who believed they would drink as adults crisscrossed by groups every other year, with the exception that K-6 Growing Healthy students reported lower percentages for two consecutive measurement times--seventh and ninth grades. Only 44 percent of the Growing Healthy students reported that they believed they would drink as adults, compared to 58 and 64 percent for the Text/Growing Healthy and the Text Only groups of students at ninth grade. However, the Growing Healthy students' views changed over the next two years to exceed the levels of the other group.

Experimentation with Drugs

A third area of interest in this study was the extent to which the three groups of students had experimented with, used, or expected to use marijuana and other dangerous drugs as adults. Questions that pertained to student behavior in the use of drugs was limited to the experimentation and future expectancy to use drugs. Since asking students if they used drugs on a regular basis would seek admission of engaging in an illegal act and would violate privacy rights of the students, such questions were not asked. Presented in Table 5 are the percentages of students in each of the three groups who responded to these questions. These percentages are then presented graphically in Figures 8 and 9.

As can be seen in Table 5, the reported incidence of students involved in experimentation with drugs or associating with friends who had experimented with drugs was much lower than their experimentation with either smoking or drinking. While several significant differences were found, particularly in the lower grades, the increase in reported experimentation and friends' experimentation with drugs between seventh and ninth grades is cause for concern. While only about 10 percent of the students in all groups reported having experimented with drugs at the end of the seventh grade, by the beginning of the ninth grade the number of students who reported experimenting with drugs increased to over 30 percent. For those students who had received only the standard textbook approach to health education, the percentage increased from 10 percent to 40 percent. These percentages for students who had received all or part of the Growing Healthy curriculum for seventh and ninth grades were only 11 and 26 percent, respectively. In both the categories of current experimentation and future expectancy to use drugs, ninth-grade students who had received all or part of the Growing Healthy curriculum reported significantly lower levels of expectancy for experimentation or future drug use than did those students who had not received the curriculum at any grade level. The data from Table 5 are presented graphically in Figures 8 and 9.

As can be seen in Figure 9, children's experimentation with drugs exhibited a different pattern of engagement than did their experimentation with either smoking or drinking. As noted in the graphs for both smoking and drinking, the incidence of experimentation exhibited a steady rise from third through ninth grades. Experimentation with drugs maintained a low and relatively flat profile through seventh grade, then more than tripled from the

Table 5
Percentage of Student Responses to Questions
Regarding Experience, Exposure, and Future Expectancy to Use Drugs

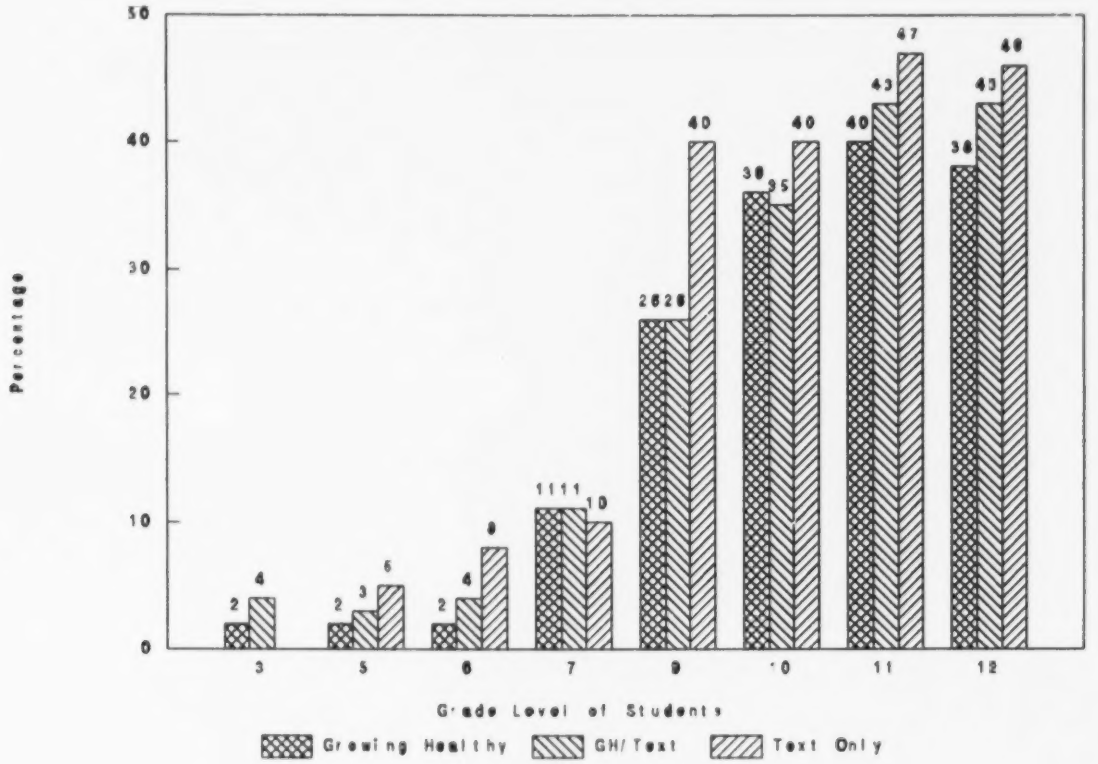
	Grade Level of Students							
	3	5	6	7	9	10	11	12
Percentage of Students Who Have Tried Drugs								
Growing Healthy	2	2*	2*	11	26*	36	40	38
Text/Growing Healthy	4	3	4	11	26	35	43	43
Text Only	-	5	8	10	40	40	47	46
Percentage of Students Who Reported that Friends had Tried Drugs								
Growing Healthy	5	1*	14*	41	58	72	79	80
Text/Growing Healthy	7	1	12	29	55	63	64	80
Text Only	-	3	22	26*	64	70	72	77
Percentage of Students Who Think They Will Use Drugs As Adults								
Growing Healthy	1	2*	2	6*	5*	6	6	7
Text/Growing Healthy	3	4	1	13	4	6	6	7
Text Only	-	4	3	11	8	9	8	9

*Denotes differences significant at the .05 level or greater.

end of the seventh to the beginning of the ninth grade. The bars in the graph take a more dramatic upswing for experimentation with drugs than for any other substance as the students got older. As can be seen in the difference between the bars on the graph at ninth grade, the differences became increasingly greater and related to whether or not the students had received the Growing Healthy curriculum. Students who had received the Growing Healthy

Use of drugs shows an alarming increase in grades 7 through 10

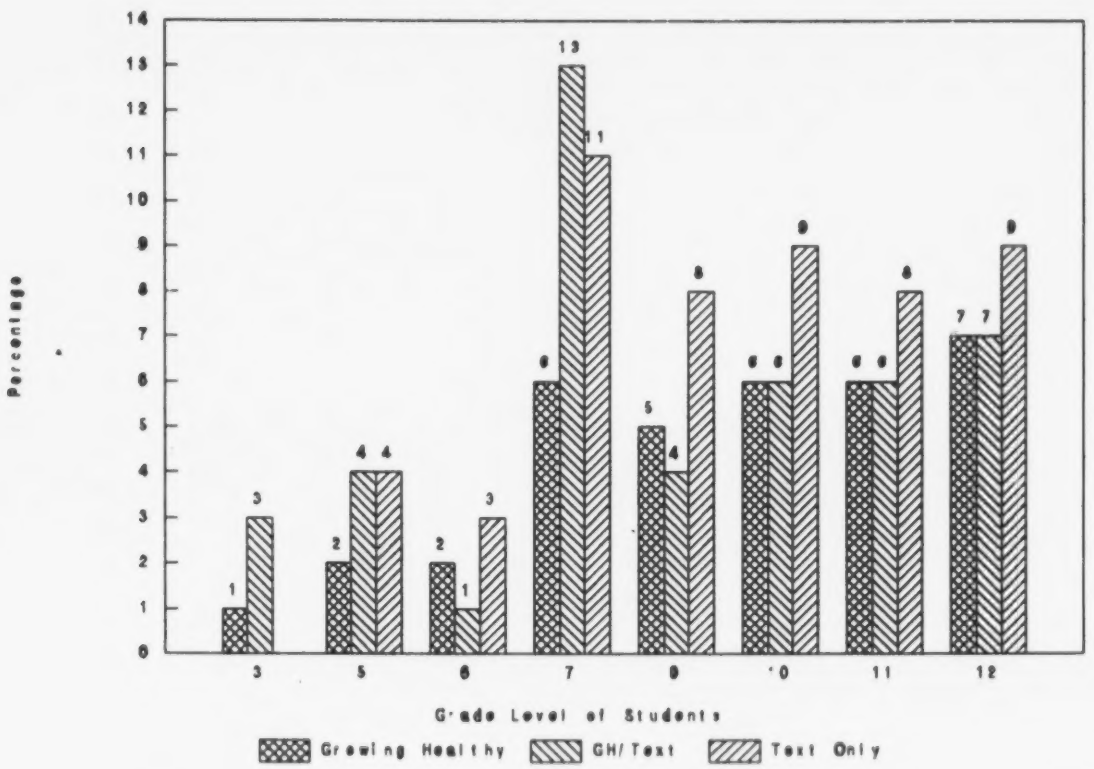
Figure 9
Percentage of Students Who Reported Having Tried Drugs
by Grade and Group (Growing Healthy, Text/Growing Healthy, and Text Only)



curriculum reported significantly lower levels of experimentation with drugs than did those who had not received the curriculum. However, the further the students got from the end of the treatment, the less the difference became. And, in fact, there were no significant differences by the time the students began twelfth grade.

Presented in Figure 10 are the comparisons of the percentage of students who expressed the belief that they would use drugs as adults. As can be seen in Figure 10, students' beliefs about their future behavior bounce back and forth among the groups of students. However, in the main, students who had received the

Figure 10
Percentage of Students Who Think They Will Use Drugs as Adults
by Grade and Groups (Growing Healthy, Text/Growing Healthy, and Text Only)



Growing Healthy curriculum from kindergarten through sixth grade tended to be the most positive about not using drugs as adults. Like their beliefs about smoking as an adult, a very low percentage of all groups of students expressed the belief that they would use drugs as adults.

Summary

This study provides much positive evidence that the elementary school curriculum that children receive has an impact upon their levels of knowledge about health and their attitudes toward health; in addition, these curricula have an impact upon present and future health practices of students.

Early intervention with children as they enter the schooling system, when compared with intervention only during the early onset years or compared with standard elementary school health curricula, had a positive impact on the level of children's health knowledge, attitudes and reported behavior in the use of tobacco, alcohol, and other dangerous drugs.

We can make a difference in the onset of substance abuse

Exposure to the Growing Healthy curriculum also suggests that the interaction between early intervention and intervention during the onset years has a more positive impact on children's health profiles than does intervention during onset alone. However, the curriculum was not sufficiently powerful to sustain the effect over time. Early gains were all but eliminated by the time the students reached the twelfth grade. These results suggest that if we are to prevent drug, alcohol, and tobacco use, improving the curriculum at the elementary school simply is not enough. Programs that focus on junior high and high school students must be used if we are to increase the chances that the early gains in elementary school are to be sustained over time.

Footnotes

1. Office on Smoking and Health, 1980 Directory of On-Going Research in Smoking and Health (Washington, D.C.: U.S. Department of Health and Human Services, Public Health Service World Health Organization, 1980.

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6. R.L. Andrews and J.T. Hearne, "The Effects of an Experimental Primary Grades Health Curriculum on Health Knowledge, Attitudes, and Behavior of Fifth Grade Students," a paper presented at the Annual Meeting of the American School Health Association, October 1984.

7. Abstracts, Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983.

8. R.L. Andrews and J.T. Hearne, "The Effects of an Experimental Primary Grades Health Curriculum on Health Knowledge, Attitudes, and Behavior of Primary Grade Students." Paper presented at the American Educational Research Association, Montreal, Canada, 1983.